



1.0 PURPOSE AND NEED

1.1 INTRODUCTION

The Mississippi Department of Transportation (MDOT) and the Federal Railroad Administration (FRA) have prepared an Environmental Impact Statement (EIS) for the railroad relocation of the BNSF Railway Company (BNSF) main line through the City of Tupelo, Mississippi.

1.1.1 Project Location

Tupelo is a community with a population of approximately 35,000, located in the northeast region of Mississippi, shown on **Figure 1-1**. Because it serves as the region's major employment center, the population of the City more than doubles during the workday as the community workforce arrives. Major employers in the community include a regional hospital, which employs approximately 4,600 people, and an active furniture manufacturing center. On average, the Tupelo economy has been growing at a rate of approximately 1,000 new jobs per year since 1970. With the job market remaining relatively stable over the past 30 years, employment models and job forecasts for Lee County indicate this growth continuing through the year 2030.

1.1.2 Study Area Description

The project study area encompasses the greater Tupelo area. Specifically, this study area includes all of Lee County, the southeastern portion of Union County, and the eastern portion of Pontotoc County, shown on **Figure 1-1**. Two rail lines pass through Tupelo, the BNSF main line and the Kansas City Southern Railway (KCS) rail line.

1.1.3 Topography

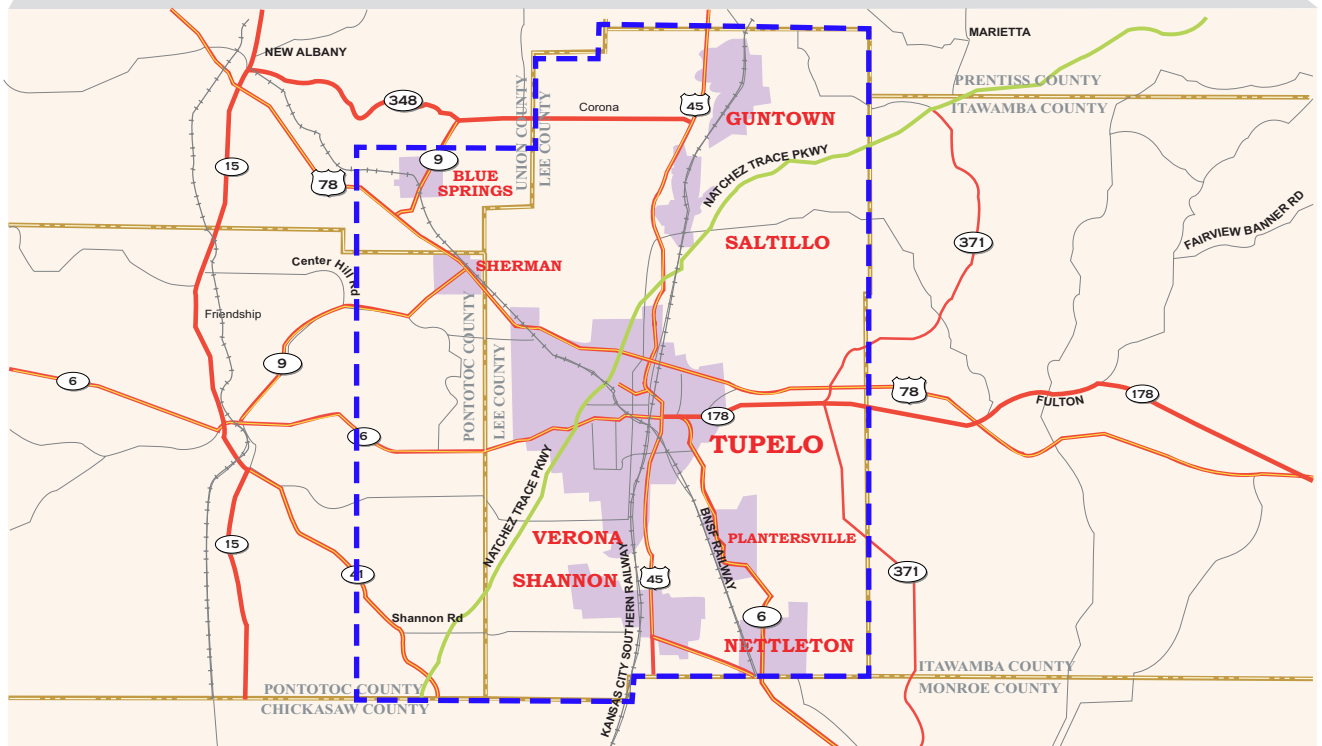
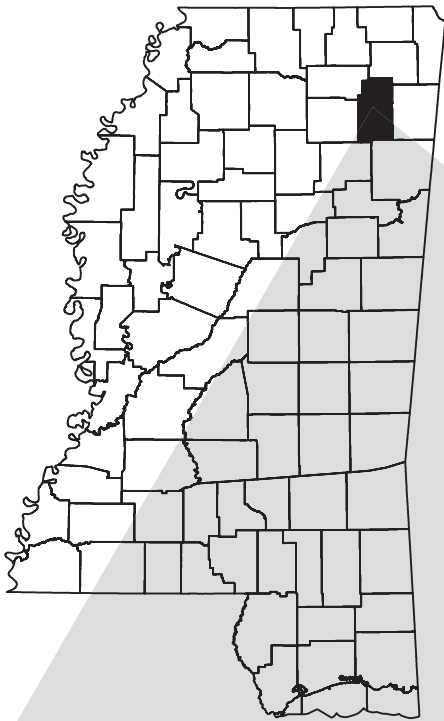
This region of Mississippi has many characteristics including urban areas, undulating rural terrain, and floodplain/floodway areas which mainly serve as agricultural lands. The area also has several creeks that are part of the Tombigbee River Basin.

1.1.4 Land Use

The land uses in the Tupelo region include agricultural, residential, commercial, industrial, and transportation. The region is also crossed by the Natchez Trace Parkway, a scenic roadway under the jurisdiction of the U.S. National Park Service (NPS). Agricultural and industrial uses are primarily found around the existing rail corridor.

1.1.5 History

The City of Tupelo was founded in 1859 after the completion of the Mobile and Ohio Railroad, which is now the KCS rail line, and later incorporated in 1870. Tupelo's modern history can be traced to 1887 with the construction of the Kansas City, Memphis & Birmingham Railroad, which is now the BNSF main line.



LEGEND

- Primary Road
- Secondary Road
- Road
- Rail
- National Parkway
- US Highway
- State Highway
- County Boundary
- Study Area

Tupelo Mississippi Railroad Relocation Planning & Environmental Study

Location Map

Figure 1-1



Tupelo's location and accessibility to the railroads have made it an industrial hub for many years, despite several changes in its economy.

1.2 PURPOSE

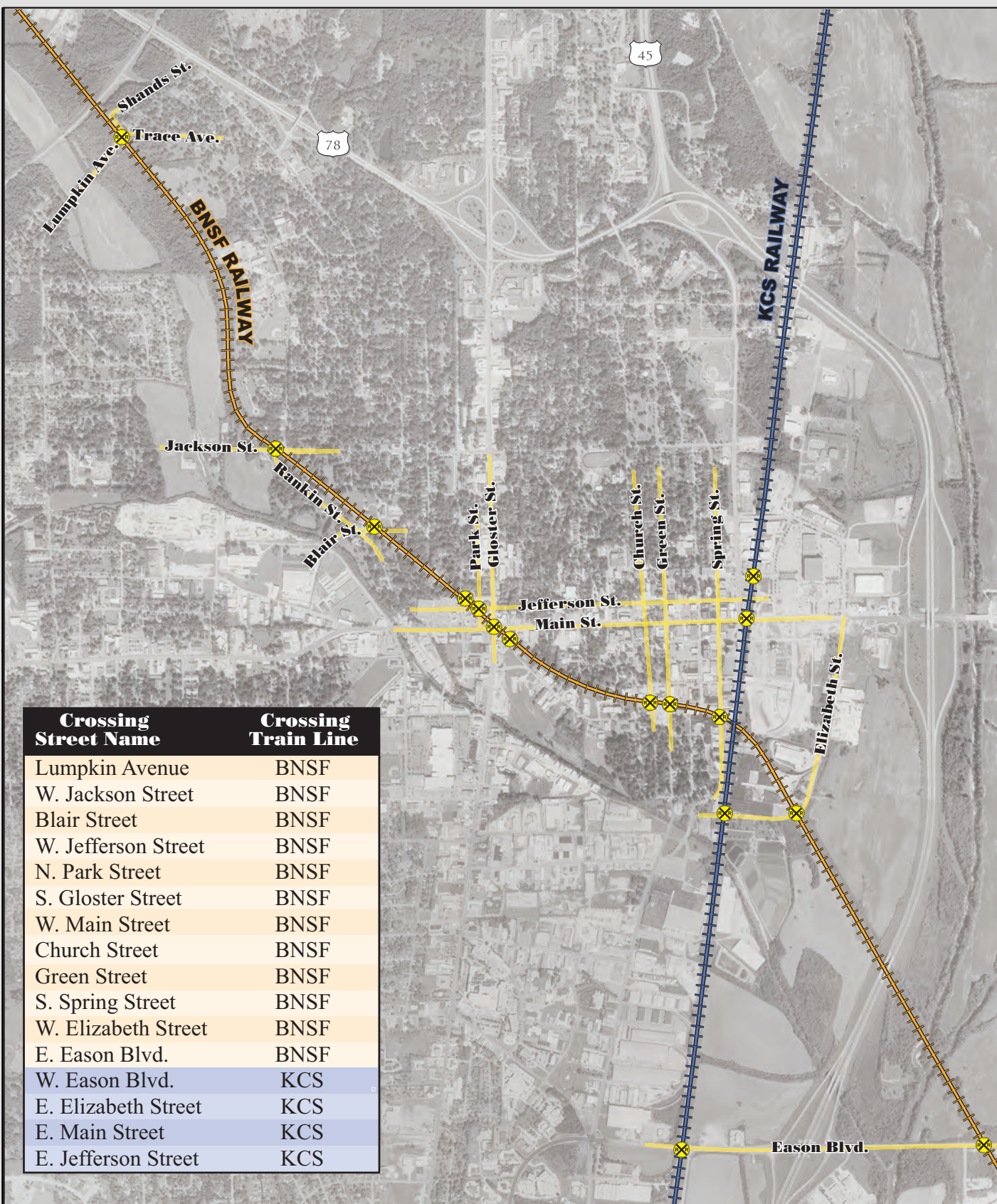
In recent years, the City of Tupelo has become concerned that highway-rail traffic conflicts are having an adverse impact on the community. These impacts include congestion, safety, efficiency of railroad operations, and quality of life issues, such as railroad and horn noise, vibration, and air pollution. The purpose of the Tupelo Railroad Relocation Planning and Environmental Study is to improve mobility and safety by reducing roadway congestion caused by the movement of trains running through the City of Tupelo, especially at the intersection of Main Street and Gloster Street (locally referred to as "Crosstown").

1.2.1 Project Background and Study History

The BNSF and KCS rail lines share an interchange to exchange rail cars just south of downtown Tupelo. There are approximately 86 at-grade highway/rail crossings within the study area. Sixteen of those at-grade highway/rail crossings are in downtown Tupelo, shown on **Figure 1-2**. Twelve of those are owned by BNSF and four by KCS. The BNSF main line crosses diagonally at-grade at the Crosstown intersection. This intersection has an annual average daily traffic (AADT) count of 39,000 vehicles per day (vpd), making it one of the busiest intersections in the City. Because of the highway traffic delays caused by the movement of trains in and through Tupelo, the City requested that MDOT conduct a rail relocation study to determine whether improvements could be made to the rail lines in the Tupelo area in order to alleviate some of the impacts from rail operations while maintaining railroad service, which is important to the City and surrounding areas.

In 2000, MDOT contracted with Wilbur Smith Associates to perform a reconnaissance study. The study concluded that various improvement options, including re-routing the rail traffic around the City, were feasible and that further study was warranted. A draft Purpose and Need Statement was developed as a result of that study. MDOT and the City agreed that from both feasibility and economic perspectives, further studies were justified and necessary. In 2004, Congress provided funding for the National Environmental Policy Act (NEPA) analysis necessary to advance the project, and shortly thereafter, MDOT commenced the Tupelo Railroad Relocation Planning and Environmental Study, and FRA agreed to serve as the lead Federal agency for the EIS.

MDOT's objectives for the Tupelo Railroad Relocation Planning and Environmental Study are to re-examine the feasibility of the options for improving rail operations in Tupelo, identify the benefits and costs of each; to prepare an EIS; determine a preferred alternative; and, ultimately, if a project is to be advanced, to obtain a Record of Decision (ROD). In May 2006, the FRA and MDOT completed Phase 1, the Feasibility Analysis, which evaluated the current and future traffic levels on both the local roadways and railroads. It also evaluated the cost of current and future traffic delay to the motoring public as a result of railroad crossings and discussed



LEGEND

- Street
- At Grade Railroad Crossing
- BNSF Railroad
- KCS Railroad

**Tupelo Mississippi Railroad Relocation
Planning & Environmental Study**

Existing At-Grade
Rail Crossings

Figure 1-2



potential improvements to the existing rail lines and transportation network that would help reduce traffic delays. As detailed in *Phase I – Feasibility Analysis* (HDR, May 2006), the traffic level of service (LOS) was estimated at the 16 existing at-grade intersections and 13 nearby intersections for the initial year (2005) and the design year (2030), shown in **Table 1-1** and **Table 1-2**.

Table 1-1 At-Grade Crossing LOS Summary

Crossing Line	Crossing Street Name	2005 Peak Hour		2030 Peak Hour	
		LOS for Through Trains	LOS for Switching Operation	LOS for Through Trains	LOS for Switching Operation
BNSF	Lumpkin Ave.	B	F	D	F
	Jackson St.	B	F	D	F
	Blair St.	B	F	D	F
	Jefferson St.	B	F	D	F
	Park St.	B	F	D	F
	Gloster St.	B	F	D	F
	Main St.	B	F	D	F
	Church St.	B	F	D	F
	Green St.	B	F	D	F
	Spring St.	B	F	D	F
	Elizabeth St.	C	F	E	F
	Eason Blvd.	C	F	F	F
	Eason Blvd.	A	E	A	F
KCS	Elizabeth St.	A	F	A	F
	Main St.	A	E	A	E
	Jefferson St.	A	E	A	E
	Jefferson St.	A	E	A	E

The LOS is a letter designation that describes a range of traffic operating conditions on a particular facility. Six levels of service are defined by the Transportation Research Board's 2000 Highway Capacity Manual (HCM) for capacity analysis. They are given letter designations A through F, with LOS A representing ideal operating conditions, D representing unfavorable conditions, E representing unsatisfactory conditions, and F representing a failing LOS. LOS E and F are generally considered to be unacceptable conditions.

The results of the traffic analysis showed that all of the at-grade intersections on the BNSF main line would operate at LOS D or worse by the year 2030 with passing trains, with two at-grade intersections operating at an unacceptable LOS. In addition, four nearby intersections would operate at an unacceptable LOS with passing trains in the year 2030. All intersections would operate at an unacceptable LOS for the switching operations in both 2005 and in 2030.

Table 1-2 Nearby Intersection LOS Summary

Intersection	Intersection Traffic Control	2005 Peak Hour LOS		2030 Peak Hour LOS	
		No Train Traffic	With Train Traffic	No Train Traffic	With Train Traffic
Clark St. at Church St.	Un-signalized	A	C	A	D
Gloster St. at Main St.	Signalized	C	F	F	F
Clark St. at Spring St.	Un-signalized	A	C	B	D
Spring St. at Elizabeth St.	Un-signalized	A	B	A	D
Front St. at Main St.	Signalized	B	B	B	B
Front St. at Jefferson St.	Signalized	A	A	B	B
Park St. at Jefferson St.	Signalized	B	D	C	E
Rankin St. at Blair St.	Signalized	A	B	A	C
Rankin St. at Jackson St.	Un-signalized	A	C	A	E
Eason St. at Ryder St.	Un-signalized	A	C	A	C
Eason St. at Whitaker St.	Un-signalized	A	A	A	A
Lumpkin Ave. at Shands St./Trace Ave./Kincannon St.	Un-signalized	A	C	A	C
Gloster St. at Jefferson St.	Signalized	A	B	B	F

The traffic delay, as a result of this congestion, would have a cost to the community for the increased time and fuel consumption for idling vehicles. This congestion cost was calculated based on the Texas Transportation Institute congestion cost methodology for both the at-grade crossings and the nearby intersections for the time period between the initial year (2005) and the design year (2030). The total congestion cost as a result of the automobile traffic delay, summarized in **Table 1-3**, is approximately \$1.25 billion.

Table 1-3 Cumulative Cost of Congestion from Year 2005 to Year 2030

	At-Grade Crossing	Near-by Intersections as Secondary Impact	Total Cost of Congestion
From 2005 to 2030	\$402,621,900	\$848,183,750	\$1,250,805,650

As detailed in *Phase I – Feasibility Analysis* (HDR, May 2006), the Phase 1 study indicated that there were feasible alternatives and the study should proceed into Phase 2, the Environmental Analysis. The FRA published the Notice of Intent to proceed with the preparation of an EIS in the Federal Register on January 17, 2007. Several Federal agencies agreed to serve as cooperating and commenting agencies to assist in the development of the EIS, including:

- Federal Highway Administration (FHWA);
- U.S. Environmental Protection Agency (EPA);
- U.S. Department of the Interior – National Park Service (NPS);
- U.S. Department of the Interior – Fish & Wildlife Service (USFWS);
- U.S. Army Corps of Engineers – Mobile District (USACE); and



- U.S. Army Corps of Engineers – Vicksburg District (USACE).

1.3 NEED

The proposed project will address the following identified needs:

- **Reduce vehicular traffic delays** in downtown Tupelo
- **Improve response for emergency vehicles**
- **Improve the safety of the traveling public**
- **Improve efficiency of railroad operations** in the Tupelo area
- **Enhance quality of life** with regard to traffic flow, noise, and economic development

1.3.1 Traffic

Presently, the BNSF main line runs diagonally through the Crosstown intersection. This intersection is blocked for a total of over two hours each day by train traffic. In addition to the train traffic from through trains, BNSF and KCS exchange rail cars just south of Crosstown, and this compounds the amount of time this intersection is blocked by rail traffic. There are 12 at-grade roadway-rail crossings in the City of Tupelo, including Crosstown, on the BNSF main line and four at-grade roadway-rail crossings on the KCS rail line that contribute to the traffic and safety issues. The crossings are listed in the table shown on **Figure 1-2**. The BNSF currently operates 20 to 25 trains per day through the City, while KCS operates two to three trains per day.

According to the 2004 AADT maps from the MDOT Planning Division, Gloster Street has an AADT of 22,000 vpd while Main Street has an AADT of 17,000 vpd. Most of the BNSF trains are through-trains that run at a maximum speed of 20 miles per hour (mph), with each train blocking the intersection for only a few minutes, but the total delay is significant. One or two trains per day exchange an average of 15 cars each, but the interchange frequently includes exchanges of as many as 40 cars. This can block the intersection for a much longer time, as much as 15 or 20 minutes. The rail traffic causes significant vehicle traffic delays. By the year 2030, rail traffic is expected to grow to 40 trains per day on the BNSF rail line and four trains per day on the KCS rail line, creating more delays and traffic congestion. As documented in the *Phase 1 – Feasibility Analysis* (HDR, May 2006), automobile traffic in 2005 at Crosstown experienced a daily total of 210 hours of cumulative delay. Based on a 250-day work year, drivers experience over 52,500 hours of delay, which equates to a total annual workday delay cost of \$7.8 million. By 2030, this cost is estimated to increase to approximately \$25 million annually, with a cumulative cost of \$1.25 billion.



1.3.2 Safety

1.3.2.1 Emergency Vehicle Response Times

Delay to emergency vehicles is also a major concern. The North Mississippi Medical Center (NMMC) is the primary source of emergency care in Tupelo as well as throughout the entire northeast Mississippi region. NMMC is the largest hospital in Mississippi and the largest non-metropolitan hospital in the U.S. The hospital is located on South Gloster Street in the Crosstown area near the KCS classification yard. Because of its location, emergency vehicles traverse the railroad crossings at Crosstown and Eason Boulevard an estimated 80 to 100 times per day and are delayed an average of four times per day. When stopped at these railroad crossings, an emergency vehicle can be delayed up to an additional 15 minutes before reaching the hospital. Because of the possibility that a particular crossing may be blocked by a train, emergency vehicle drivers frequently must choose between risking that the crossing is clear and waiting when it is blocked, or taking a longer alternate route, either of which can dangerously increase response time.

1.3.2.2 Vehicular and Pedestrian Accidents

According to FRA accident data for Lee County for the period from 2000 through 2009, there have been 13 vehicular accidents and three pedestrian accidents involving BNSF trains and five vehicular accidents and no pedestrian accidents involving KCS trains. There are 16 at-grade crossings in the City of Tupelo, shown on **Figure 1-2**. FRA has ranked all of these crossings in the top quartile for predicted accidents in the State of Mississippi. The Crosstown at-grade crossing has an AADT of 39,000 vpd. Twenty-three trains per day travel through this intersection, resulting in an exposure index (number of trains multiplied by the AADT) of 897,000. The exposure index is an indication of the potential hazards at a crossing. With an exposure index of 897,000, this intersection has one of Mississippi's highest exposure ratings and, therefore, is a crossing with one of the highest probability for accidents in the state. Due to the nature of the crossing, only warning lights, crossbucks, and bells are in place at Crosstown. Gates are not present and would restrict right turns during train events if installed, which would further increase delays. Although the potential for accidents cannot be measured precisely and the crossing does not have a history of significant accidents, it is reasonable to conclude that reduced exposure of vehicle trips and train trips at these complicated at-grade crossings would result in improved safety for the traveling public.

1.3.3 Railroad Operations

Trains, trucks, and ships are used to provide long haul service. Following World War II, trucks took a large portion of the market share of long haul shipping from rail service. Since 1980, however, tonnage shipped by rail has increased dramatically due primarily to deregulation of the industry coupled with the growth of trade with



emerging Asian countries and technological advances that have made shipping by rail more cost-effective.

Various types of trains operate on the Tupelo area rail lines on a weekly basis. The types of trains include bulk (coal and rock), intermodal, autorack, manifest, and local trains. Currently, BNSF averages 20 to 25 trains per day totaling 65 to 75 million gross tons (MGT) annually, and KCS averages two to three trains per day totaling 2 to 3 MGT annually. Trains have been found to be three times more fuel efficient and carry goods at lower costs than trucking. In addition, recent fluctuations in fuel costs have led to an even greater demand for rail service. As a result, the number of trains traveling through the City of Tupelo is expected to increase to 44 trains per day by the year 2030. Because of this projected increase in trains per day, increasing speed and efficiency of freight movement through the region is a high priority.

Currently, because of the configuration of the existing rail lines, trains are required to traverse the downtown Tupelo area on the BNSF main line at a maximum speed of 20 mph. Improvement of the rail facilities would allow for train speeds to increase up to 40 mph, thereby greatly improving the efficiency of the freight rail movement in the region.

1.3.4 Social Demands

Railroads were essential to the growth and development of Tupelo. The City was organized in 1859 as a result of the completion of the Mobile and Ohio Railroad. Tupelo's development dramatically increased upon the completion of the Kansas City, Memphis & Birmingham Railroad in 1887. The railroads were heavily utilized and became the center of activity and industry for the town. Over the past half-century, however, the City has grown and become less dependent upon the railroads for economic survival. This is a recurring theme throughout the country as trains that once brought economic prosperity and social cohesion are now sometimes viewed as factors in the decline of both. As a result, the City of Tupelo now desires not only to improve mobility but also to improve overall quality of life. As currently configured, the rail lines have a detrimental impact on quality of life, most notably with regard to rail-related noise.

A freight train generates noise levels ranging from 70 decibels (dBA) when the train is idling to 115 dBA when the horn is blowing. As a comparison, 70 dBA is about the same noise level as that of a blender while 115 dBA is between the noise level of a siren and a jet plane. Excessive noise has the potential to disrupt routine activities, which can affect the overall quality of life, especially in sensitive areas such as residences, recreational facilities, churches, synagogues, parks, and schools. Removal of the rail traffic from the downtown area, or a reduction in horn sounding, would reduce the noise and, as a result, improve the quality of life for residents in the City.



Traffic delay and congestion in the downtown area also leads to excessive idling by vehicles delayed at the railroad crossings. This idling results in increased emissions of carbon monoxide. Because of harmful effects to the public health and the environment, carbon monoxide is referred to as a criteria air pollutant and is monitored by the U.S. Environmental Protection Agency (EPA) along with lead, nitrogen dioxide, ozone, sulfur dioxide, and particulate matter (dust). Although Tupelo is in an attainment area (i.e. levels of these pollutants do not exceed the national Ambient Air Quality Standards [NAAQS]) for these criteria pollutants, any decrease in the emission of carbon monoxide would improve air quality, improving the quality of life.

1.3.5 Economic Development

1.3.5.1 Economic Growth

This project could result in opportunities for economic growth resulting from the realignment of the rail lines. Historically, the railroad has been at the City's center of activity, and many businesses were located along the rail lines because the railroad offered the fastest and most convenient mode of transportation for their goods. The railroad is still a vital means of transportation, but most rail customers have relocated outside of the center of the City of Tupelo. Because there are very few rail customers located in downtown Tupelo, realigning the rail lines has the potential for enhancing economic development opportunities in the region, while minimizing disruption of rail service to existing industries. Removal of some or all of the at-grade roadway-rail crossings in central Tupelo would remove the majority of the \$1.25 billion congestion cost and allow for additional economic development as a result of reduced traffic delay.

1.3.5.2 Central Business District

The Tupelo Central Business District (CBD) is a vital part of the Tupelo's economy and defines its cultural heritage. The Tupelo CBD is home to an array of restaurants and shops as well as to the NMMC.

Tupelo is currently engaged in an urban renewal project designed to renovate the Fairpark District, the former fairgrounds area located in the heart of downtown. Fairpark is a mixture of commercial, residential, retail, and public structures that includes the City Hall, the Tupelo Auto Museum, the Hilton Garden Inn, and the BancorpSouth Arena and Conference Center. Improving mobility and safety for road users would provide better access to Tupelo's CBD, improving the attractiveness of the downtown area for businesses, residents, and tourists.



1.3.6 Modal Interrelationships

The City of Tupelo provides opportunities for intermodal connections in addition to the service provided by the two rail lines. The Tupelo Municipal Airport offers multiple commercial carriers and service for private use aircraft. The airport is undergoing an expansion of its facilities to provide additional services.

In addition, several major highways serve Tupelo. U.S. Highway 78 (US 78) is an east-west route that runs from Memphis, Tennessee to Charleston, South Carolina. The section of US 78 from Memphis, Tennessee to Birmingham, Alabama is also known as Appalachian Highway System Corridor X and is currently being upgraded to a controlled access freeway, future Interstate 22 (I-22). US 45 is a north-south route from Mobile, Alabama through central Tennessee. The Natchez Trace Parkway, the Appalachian Highway System Corridor V, and numerous other state and county roadways service the Tupelo area.

The removal of at-grade crossings within central Tupelo, especially at Crosstown, will allow for greater mobility of surface transportation to the airport and better traffic flow along the local highways.